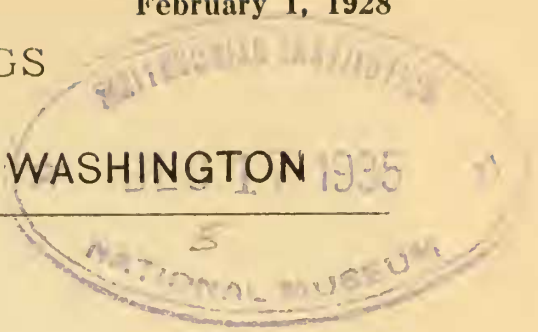


PROCEEDINGS  
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FIVE NEW MAMMALS OF THE RODENT GENERA  
SCIURUS, ORTHOGEOMYS, HETEROMYS, AND  
RHEOMYS, FROM EL SALVADOR.<sup>1</sup>

BY DONALD R. DICKEY.

The whole group of large Central American squirrels is of peculiar interest because of the wide diversity shown in color and pattern by the many described forms. In certain areas the color is homogeneous throughout a series, whereas in other areas the range of individual variation is great, and the local forms in such cases are unstable, or at least difficult to characterize, because of wide departure from the mean. The latter condition probably indicates comparatively recent intergradation of distinct forms in these areas. Unfortunately many Central American names have been based on such material. It would have been preferable if the type localities could have been located in areas of stability; early conditions prevented this, of course, but our abundant Salvador material now makes it possible to plot two such stable areas in that country. In the Oriente, the animal long known as *Sciurus variegatoides variegatoides*<sup>2</sup> Ogilby is found, while the western part of the country has given rise to the race described below.

*Sciurus variegatoides bangsi*, subsp. nov.

BANGS' SQUIRREL.

*Type*.—Male adult; no. 12,746, collection of Donald R. Dickey; Barra de Santiago, Dept. Ahuachapan, El Salvador, C. A.; sea level; April 3, 1927; collected by G. D. Stirton.

<sup>1</sup>Contribution from the California Institute of Technology.

<sup>2</sup>For discussion of type locality, see Nelson, Proc. Washington Acad. Sci., vol. 1, 1899, p. 79-81.

*Characters.*—Nearest externally to *Sciurus goldmani* Nelson, but lighter and grayer than the grayest extreme of that variable form, with less black hairs interspersed through the pelage of the back, and with no trace, in fresh pelage, of the rusty wash which gives tone to the whole dorsal pelage of *goldmani*. A soiled buffy wash is present in old, worn pelage, but this is due to fade and stain alone. Face in particular much lighter (light pepper and salt gray) than in the dark-faced *goldmani*. Ears narrowly edged with black posteriorly, and with a narrow anterior border of black, or sometimes rusty; buffy or rusty terminal ear tuft reduced to a minimum in area, and comparatively dull in tone; very prominent basal ear patch, pure white. Feet very light gray; toes white. Whole underparts white. Tail black and white both above and below, with no trace of rusty, the individual hairs being banded with black and white alone. The type and topotypes are remarkably uniform in color, indicating a stable race. The type is in old, worn pelage with the fresh, clear gray and white new coat just coming in, so far involving only the left hind foot and patches on the face, forelegs and underparts. Specimens from San José del Sacare are in full fresh pelage.

Skull similar to that of *variegatoides*; averaging wider and more rugged than in *goldmani*.

*Measurements of type.*—Total length, 520 mm.; tail, 260; hind foot, 60; ear, 23. Skull: greatest length, 59.5; basilar length of Hensel, 45.7; zygomatic breadth, 35.1; interorbital constriction, 19.9; length of nasals, 21.0; palatilar length, 25.7; maxillary tooth row, 12.0; breadth across molars, 14.4; shelf of bony palate, 19.7.

*Range.*—Western El Salvador from the Department of Chalatenango south and west to the seacoast in the Department of Ahuachapan; undoubtedly ranging into southeastern Guatemala.

*Remarks.*—Two specimens from the Department of Chalatenango are both so obviously intermediate between *bangsi* and *variegatoides* as to make it certain that these two races are conspecific. On the other hand, certain specimens from the type locality of *goldmani* vary so much from the mean toward *bangsi*, as to leave no doubt in the writer's mind that actual intergradation, or at least overlap of characters, also occurs between the two forms last named. The races of *Sciurus variegatoides*, with their type localities, would thus stand

<i>Sciurus variegatoides variegatoides</i> Ogilby	La Union, La Union, El Salvador.
<i>Sciurus variegatoides bangsi</i> , subsp. nov.	Barra de Santiago, Ahuachapan, El Salvador.
<i>Sciurus variegatoides goldmani</i> Nelson	Huehuetan, Chiapas, Mexico.

*Specimens examined.*—*Sciurus variegatoides variegatoides*: El Salvador: La Union: [East shore of] Lake Olomega, 2<sup>1</sup>; Pine Peaks, Volcan Conchagua, 2. San Miguel: Lake Olomega, 7<sup>1</sup>; Mt. Cacaguatique, 2; Rio San Miguel, 3; Volcan San Miguel, 2. Usulután: Puerto del Triunfo, 1. Total, 19.

<sup>1</sup>Practically topotypes.

*Sciurus variegatoides bangsi*: El Salvador: Ahuachapan: Barra de Santiago, type and 6 topotypes. Chalatenango: San José del Sacare, 6 (series averages quite typical, but one specimen strongly intermediate toward *variegatoides*); Los Esesmiles, 1 (intermediate toward *variegatoides*). Sonsonate: Hacienda Chilata, 2. Santa Ana: El Tablan, Lake Guija, 1. Total, 17. *Sciurus variegatoides goldmani*: Mexico: Chiapas: Huehuetan, type and 6 topotypes. Total, 7.

Pocket gophers of the genus *Orthogeomys* occur in suitable associations throughout El Salvador. Specimens from the Oriente extend our concept of the distribution of the genus considerably to the south and east of the range as heretofore known. These specimens apparently belong to an undescribed species which may be known as follows:

***Orthogeomys pygacanthus*, sp. nov.**

MT. CACAGUATIQUE POCKET GOPHER.

*Type*.—Female adult; no. 10,803, collection of Donald R. Dickey; Mt. Cacaguatique, Dept. San Miguel, El Salvador, C. A.; altitude, 3,500 feet; December 3, 1925; collected by R. A. Stirton.

*Characters*.—Closest externally to *Orthogeomys scalops* (Thomas), but smaller and with color a trifle darker (between the Vandyke Brown<sup>1</sup> of *scalops* and Light Seal Brown); pelage harsher and more setose, particularly on the rump, with a more strikingly glossy sheen. Much darker than *Orthogeomys grandis* (Thomas) which is between Bister and Vandyke Brown, to judge by specimens of the latter from Volcan Santa Maria, Quezaltenango, Guatemala, in the Biological Survey collection, U. S. National Museum. Pelage shorter and more hispid than in *grandis*. Tail comparatively short; naked. Feet naked except for scattering silvery hairs in fresh pelage.

Skull much shorter than those of *scalops* and *grandis*, and smaller in all dimensions except in the matter of zygomatic breadth, in which it equals *scalops*, and in interorbital constriction, in which it exceeds *grandis*, and in rostrum width, in which it exceeds them both, not only proportionally, but actually.

Mastoid bullae smaller and more slender, as viewed from behind, than in either *scalops* or *grandis*. The distinctive, narrow, cuneate, posterior portion of the nasals of *Orthogeomys nelsoni* Merriam alone serve to differentiate it from *pygacanthus*, which has short broad nasals ending posteriorly in a broad truncate suture. Ascending arms of the premaxillae short and broad, just reaching, but not cutting, the anterior plane of the orbits. Supraorbital borders of frontals ultratypical of the genus; very straight; constriction or concavities reduced to insignificant notches; prominences also reduced or wanting. Ratio of zygomatic breadth to condylo-basal

<sup>1</sup>Colors, when capitalized in the present paper, are those of Ridgway, Color Standards and Color Nomenclature, 1912.



length 59.4 mm., as contrasted with 55.8, and 55.1, respectively, in the proportionally longer-skulled *scalops* and *grandis*. Dentition normal for the genus.

No comparison is necessary with the smaller and much lighter-skulled *Orthogeomys latifrons* Merriam, nor with the even smaller *Orthogeomys cuniculus* Elliot. The above comparisons are based upon adult females alone.

*Measurements of type.*—Total length, 341 mm.; tail, 104; hind foot, 54; ear, 4. Skull: condylo-nasal length, 62.0; basilar length of Hensel, 51.8; length of nasals, 24.0; maximum breadth of nasals, 7.6; zygomatic breadth, 36.9; breadth across squamosals, 37.0; interorbital constriction, 13.9; breadth of rostrum in anterior plane of zygomatic articulation, 14.7; maxillary tooth row at alveolar border, 14.4; articulating face of the maxillary root of the zygoma, 8.4.

*Range.*—Banana groves at the type locality.

*Specimens examined.*—The type and three topotypes.

A series of large *Heteromys* secured by R. A. Stirton at comparatively high altitudes in a range of mountains in the northwestern part of El Salvador, proves to be an apparently undescribed race of the species of *desmarestianus*. It may be known as follows:

***Heteromys desmarestianus psakastus*, subsp. nov.**

LOS ESESMILES SPINY POCKET MOUSE.

*Type.*—Male (old adult); no. 12,477, collection of Donald R. Dickey; Los Esesmiles, Dept. Chalatenango, El Salvador, C. A.; altitude 8,000 feet; "caught under rotten log among ferns, in oak rain forest"; February 7, 1927; collected by R. A. Stirton.

*Characters.*—Size large, but not maximum for the group. Nearest to the stock form *Heteromys desmarestianus desmarestianus* Gray, but consistently larger in body mass. Color nearly as in *desmarestianus*, but a trifle lighter; shade of lateral line and colored portion of fine, banded, guard hairs lighter and more buffy (Light Pinkish Cinnamon instead of Vinaceous-Cinnamon). Lateral line variable; generally present but rarely strong or conspicuous. Narrow white line almost always present on inner side of hind legs, extending continuously from thigh to foot.

Skull nearest to that of *desmarestianus*, but averaging larger, with less arched profile, greater spread across the zygomatic arches, and with definitely longer nasals. The latter generally reach quite to the plane of the posterior suture of the ascending arms of the premaxillae in *psakastus*, instead of falling short of the premaxillae as in *desmarestianus*.

*Measurements of type.*—Total length, 345 mm.; tail, 190; hind foot, 34; ear, 14. Skull: greatest length, 38.0; basilar length of Hensel, 27.0; zygomatic breadth, 17.4; braincase breadth, 15.5; interorbital constriction, 9.5; nasal length, 15.7; maximum spread of temporal ridges, 13.8; maxillary tooth row, 5.4 (worn).

*Range*.—Rain forest at the summit of the range at the type locality.

*Remarks*.—In view of the comparisons made by Gerrit S. Miller, Jr., with the type of *desmarestianus*, as recorded by E. A. Goldman (North American Fauna, No. 34, 1911, p. 22), the series of specimens from Tumbala, Chiapas, is here considered sufficiently typical of that form for the purposes of the present paper. *Psakastus* shares certain characters with *Heteromys fuscatus* Allen, but its larger size, lateral band, white-lined ankles and lighter coloration forbid its being considered as intermediate between *desmarestianus* and that species. Close comparison is not necessary with the much larger *Heteromys goldmani* Merriam, nor with the much lighter *Heteromys desmarestianus griseus* Merriam. The lighter coloration and short, heavy rostrum, and particularly the unusual shape of the nasals of *Heteromys longicaudatus* Gray, suffice to set that species apart from our race.

*Specimens examined*.—The type and 24 topotypes.

The series of water mice of the genus *Rheomys* secured by Mr. Stirton in El Salvador, during November and December, 1925, was found to bear no close relationship to *Rheomys raptor* Goldman, when compared with the type of that species in Washington. Specimens of our series were therefore forwarded to Oldfield Thomas, who was so good as to compare them with the type of *Rheomys underwoodi* Thomas in the British Museum. Mr. Thomas' full manuscript notes indicate that our series represents a new species, which is characterized below. In view of the fact that the genus was first made known to science by Mr. Thomas, and in appreciation of his cordial helpfulness in the present connection, it is a pleasure to dedicate this species to him.

***Rheomys thomasi*, sp. nov.**

THOMAS' WATER MOUSE.

*Type*.—Female adult; no. 10,917, collection of Donald R. Dickey; Mt. Cacaguatique, Dept. San. Miguel, El Salvador, C. A.; altitude 3,500 feet; "small rocky canyon stream"; December 22, 1925; collected by R. A. Stirton.

*Characters*.—Size moderate for the genus; distinctly larger than in *raptor*, but smaller than in *underwoodi*. Color almost exactly as in *underwoodi*, the type of the present species having been itself compared with the type of *underwoodi* to determine this point. Pelage shorter and less woolly than in *underwoodi*, the hairs of the back averaging 9 mm. in the present species, instead of 11 mm. or more in *underwoodi*. Hind feet narrower and more lightly built than in *underwoodi*.

*Skull.*—Decidedly smaller than in *underwoodi*, with lower, narrower braincase, and with the anterior palatine foramina reaching fully back to or beyond the anterior plane of  $m^1$ , whereas the foramina of the type of *underwoodi* end a full millimeter in front of this plane. The molars of *thomasi* are distinctly smaller and lighter than in *underwoodi*. This is particularly apparent in the matter of width,  $m^1$  in *thomasi* averaging 1.3 mm. to 1.4 mm. instead of 1.8 mm. as in *underwoodi*. The incisors of Salvador specimens are yellow, whereas those of *underwoodi* are practically white in front. This may indicate a trend in northern specimens of the genus, but I do not believe it will prove a constant character.

*Measurements of type.*—Total length, 233 mm.; tail, 125; hind foot, 33; ear, 6. Skull: greatest length, 29.4; basilar length of Hensel, 23.3; zygomatic breadth, 14.7; braincase breadth, 13.5; interorbital constriction, 5.0; nasal length, 11.2; anterior palatine foramina, 5.2; shelf of the bony palate, 5.7; maxillary tooth row, 4.5 (moderately worn); transverse diameter of  $m^1$ , 1.3.

*Range.*—The pebbly bed of a brook at the type locality, at an altitude of 3,500 feet.

*Specimens examined.*—The type and 14 topotypes.

In addition to the stock form of the species described above, another race of the same species is found high in the mountains of northwestern El Salvador. This race is described below.

***Rheomys thomasi stirtoni*, subsp. nov.**

STIRTON'S WATER MOUSE.

*Type.*—Male adult; no. 12,593, collection of Donald R. Dickey; Los Esesmites, Dept. Chalatenango, El Salvador, C. A.; altitude 8,000 feet; "caught in small stream in rain forest, north slope"; February 22, 1927; collected by R. A. Stirton.

*Characters.*—Size rather large; larger than *thomasi* but slightly smaller than *underwoodi*. Color almost identical with that of *thomasi*, but perhaps averaging a trifle browner, less blackish. Pelage longer than in *thomasi*, about as in *underwoodi*, the hairs of the back averaging 12 mm.

*Skull.*—Averaging larger than in *thomasi*, with less flattened profile, and with broader and more inflated braincase; nasals longer and more cuneate posteriorly; anterior palatine foramina wider and less parallel-sided (more bowed, particularly anteriorly), and extending back quite to or beyond the plane of  $m^1$ ; interpterygoid fossa wider than in *thomasi*;  $m^1$  slightly broader than in *thomasi*, but lighter than in *underwoodi*.

*Measurements of type.*—Total length, 253 mm.; tail, 120; hind foot, 32; ear, 7. Skull: greatest length, 29.4; basilar length of Hensel, 23.8; zygomatic breadth, 15.3; braincase breadth, 14.3; interorbital constriction, 5.1; nasal length, 12.6; anterior palatine foramina, 5.6; shelf of the bony palate, 5.9; maxillary tooth row, 4.7 (worn); transverse diameter of  $m^1$ , 1.5.

*Range.*—Bed of a small stream flowing through the rain forest at an altitude of 8,000 feet, at the type locality.



*Remarks.*—In general size this race is intermediate between *thomasi* and *underwoodi*. Its comparatively light dentition and produced palatine foramina closely resemble those of *thomasi*. Comparison has therefore been made chiefly with this form, and individual variation shows that the relationship is probably close. However, its wide and somewhat inflated braincase is definitely reminiscent of *underwoodi*, and it is not at all improbable that specimens from the mountains of Nicaragua will close the specific gap between *thomasi* and *underwoodi*.

*Specimens examined.*—The type and 3 topotypes.

In determining our Salvador material, all of the facilities of the Biological Survey and National Museum collections in Washington have been accorded me by those in charge. In particular, the splendid Nelson and Goldman collections from Mexico have been of inestimable value, for without them the difficulty of satisfactorily determining the El Salvador collections would have been increased many fold, to say the very least. The scientific staff of the Survey and those in charge of the birds and mammals of the Museum have, in addition, made me their debtor in countless other ways. Their generous helpfulness has been appreciated to the full.